



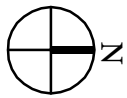
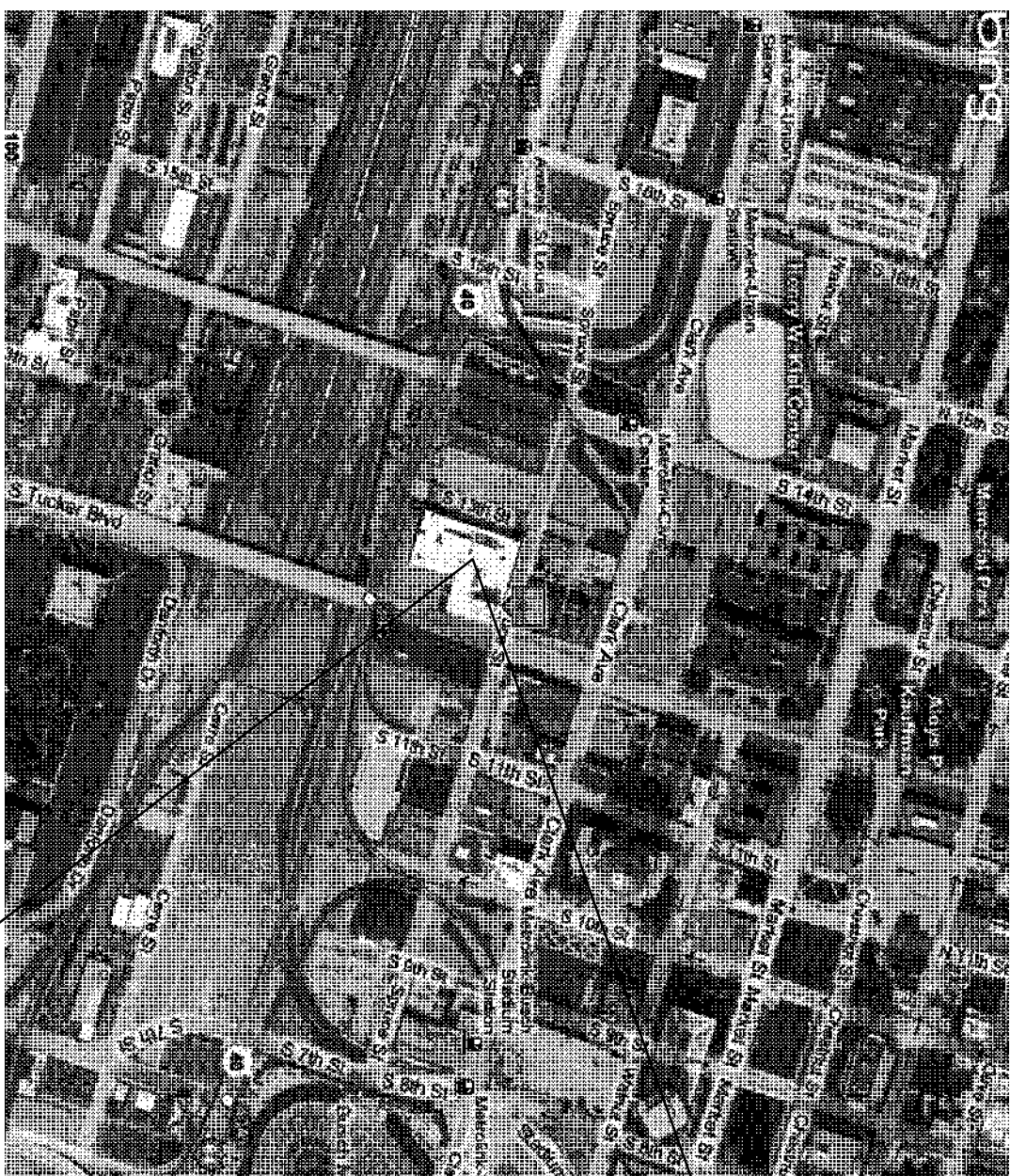
GSA PROJECT NUMBER: IM0000090
BUILDING NUMBER: MO0601AF

RAY ARRA MECHANICAL WIND / PV PACKAGE

100% FINAL SUBMITTAL


ROBERT A. YOUNG FEDERAL BUILDING
1222 SPRUCE STREET
ST. LOUIS, MO 63103

LOCATION MAP

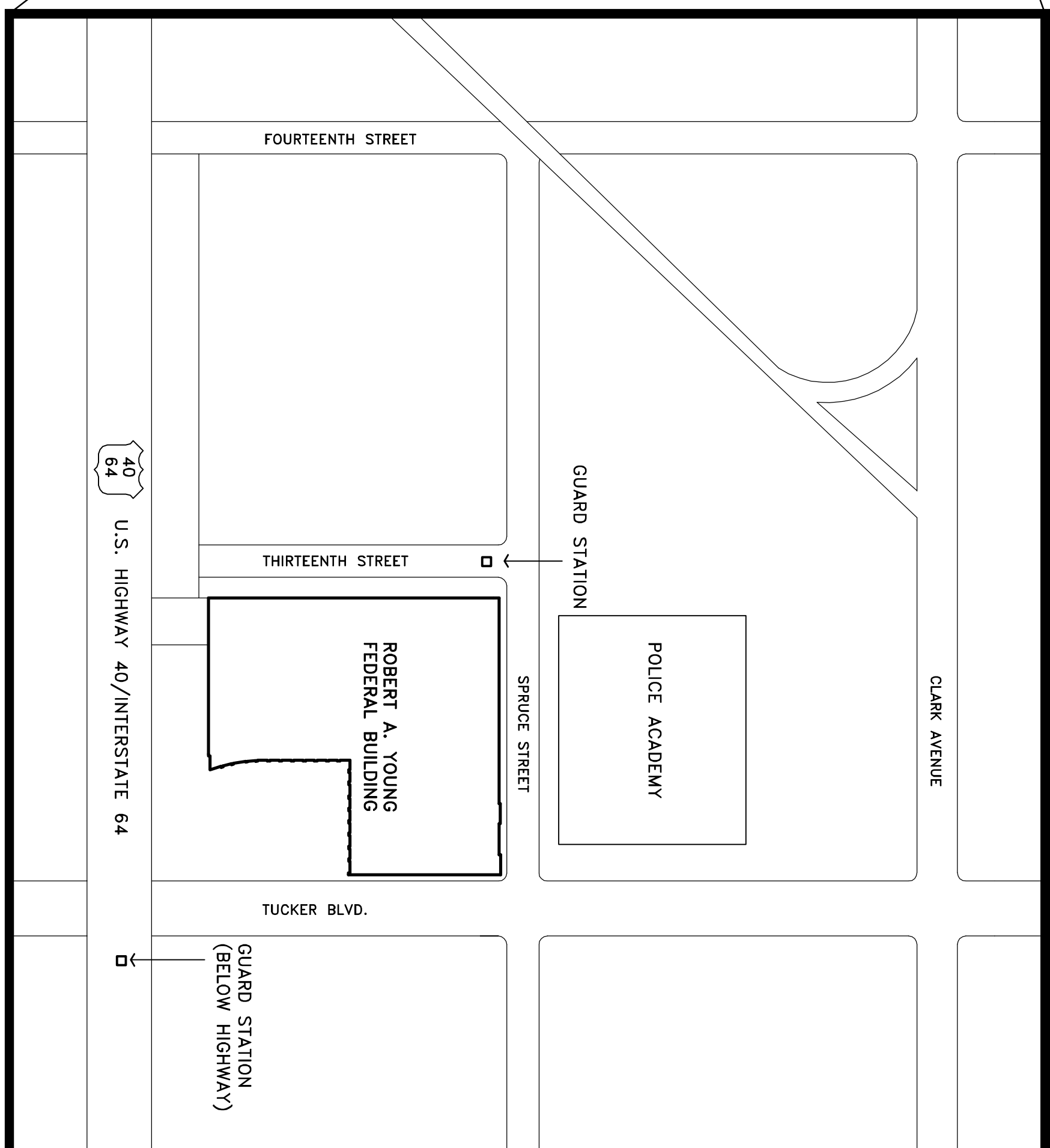
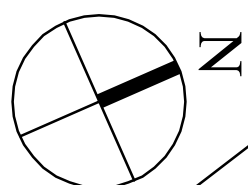


**Team
Four**

Architecture



14 North Newstead Avenue
Saint Louis, Missouri 63108
314.533.2200 phone
314.533.2203 fax



GENERAL REQUIREMENTS

- A. **GOVERNMENT OCCUPANCY**
GOVERNMENT OCCUPANCY: THE GOVERNMENT WILL OCCUPY THE SITE AND THE BUILDING DURING THE UNITED STATES OF AMERICA'S NATIONAL HOLIDAYS AND THE GOVERNMENT'S REPRESENTATIVES DURING CONSTITUTION OPERATIONS TO MINIMIZE CONFLICTS AND FACILITATE GOVERNMENT USAGE. PERFORM THE WORK IN A MANNER THAT DOES NOT INTERFERE WITH THE GOVERNMENT'S OPERATIONS.
2. **WORKING HOURS**
A. GOVERNMENT OCCUPIED HOURS: GOVERNMENT PERSONNEL ARE SCHEDULED TO OCCUPY THE BUILDING DURING THE FOLLOWING HOURS ON WEEKDAYS, MONDAY THROUGH FRIDAY, EXCEPT FOR ESTABLISHED GOVERNMENT HOLIDAYS: 8:00 A.M. TO 6:00 P.M.
B. GOVERNMENT UNOCCUPIED HOURS: MONDAY THROUGH FRIDAY 6:00 P.M. TO 6:00 A.M. AND ALL DAY SATURDAY AND SUNDAY
C. CONTRACTING GENERAL WORKING HOURS: THE CONTRACTOR'S WORKING HOURS SHALL BE SCHEDULED TO OCCUR GENERALLY DURING GOVERNMENT UNOCCUPIED HOURS WITH EXCEPTIONS AS NOTED BELOW.
D. CONTRACTORS REQUIRED WORKING HOURS: THE FOLLOWING WORK SHALL BE PERFORMED DURING GOVERNMENT UNOCCUPIED HOURS: WORK OPERATING VESSELS, COAR OR SHARPEN THE NOSE OR TAIL REQUIRE ANY DOCKING OR CUTTICES.
E. WORK CREATING EXCESSIVE NOISE IS DEFINED AS NOISE DISCRETELY IN TENANT OR PUBLIC SPACES. WORK CREATING DISRUPTIVE NOISE IS DEFINED AS NOISE AUDIBLE IN TENANT SPACES OR PUBLIC SPACES.
F. DELIVERIES AND STAGING WORK CAN BE ACCOMPLISHED DURING GOVERNMENT OCCUPIED HOURS.
G. WORK INSIDE MECHANICAL/ELECTRICAL ROOMS THAT DOES NOT DISRUPT THE TENANTS CAN BE ACCOMPLISHED DURING GOVERNMENT OCCUPIED HOURS.
H. WORK ON THE SOUTH PARKING LOT AT THE ROOF PENHOUSES, OR IN THE TOWER ABOVE THE 10TH FLOOR THAT DOES NOT DISRUPT THE TENANTS CAN BE ACCOMPLISHED DURING GOVERNMENT OCCUPIED HOURS.
I. WORK DISRUPTIVE TO TENANTS IS DEFINED TO INCLUDE ANY WORK IN TENANT AREAS COMPLETED DURING OCCUPIED HOURS THAT WOULD MORE OR LESS DISRUPT TENANT WORKFLOW.
J. WORK ACCORDING USED DURING GOVERNMENT UNOCCUPIED HOURS SHALL BE PERFORMED IN AN ADEQUATE SET TO THE GOVERNMENT CONTRACTORS SHALL SUBMIT A PROPOSED SCHEDULE AND OBTAIN THE CONTRACTING OFFICER'S APPROVAL AT LEAST 12 HOURS BEFORE PROCEEDING WITH ANY WORK DURING GOVERNMENT UNOCCUPIED HOURS.

DRAWING INDEX - WIND / PV PACKAGE ONLY

G-001	COVER SHEET
S-101	ROOF AND PENTHOUSE ROOF PLAN
EP-101	ELECTRICAL POWER ELEVENTH FLOOR AND ROOF PL
EP-102	ELECTRICAL POWER PENTHOUSE ROOF PLAN
EP-601	WIND/PV SYSTEM ELECTRICAL ONE-LINE DIAGRAM
EP-602	TYPICAL PHOTOVOLTALIC SYSTEM WIRING DIAGRAM

[illegible]

PROHIBITED

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CERTIFICATIONS

KEY PLAN

	MARK	DATE	DESCRIPTION

REVISION NOTES

GRAPHIC SCALE

CONTRACTORS	
A/E CON. NO.	GS06P04G1D0003
A/E TASK NO.	67 MODIFICATION NO. 3
CONS. CONTR.	
CONS. WORK	
PRIME A/E	TEAM FOUR ARCHITECTS, INC.
SUB A/E	WILLIAM TAO & ASSOCIATES
.....	

BUILDING	
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PROJECT	BUILDING NOS.	OTHER
PROJECT DESCRIPTION	FACILITY CODE	
	PROJECT TITLE	
	RAY ARRA MECHANICAL	
WIND / PV PACKAGE		

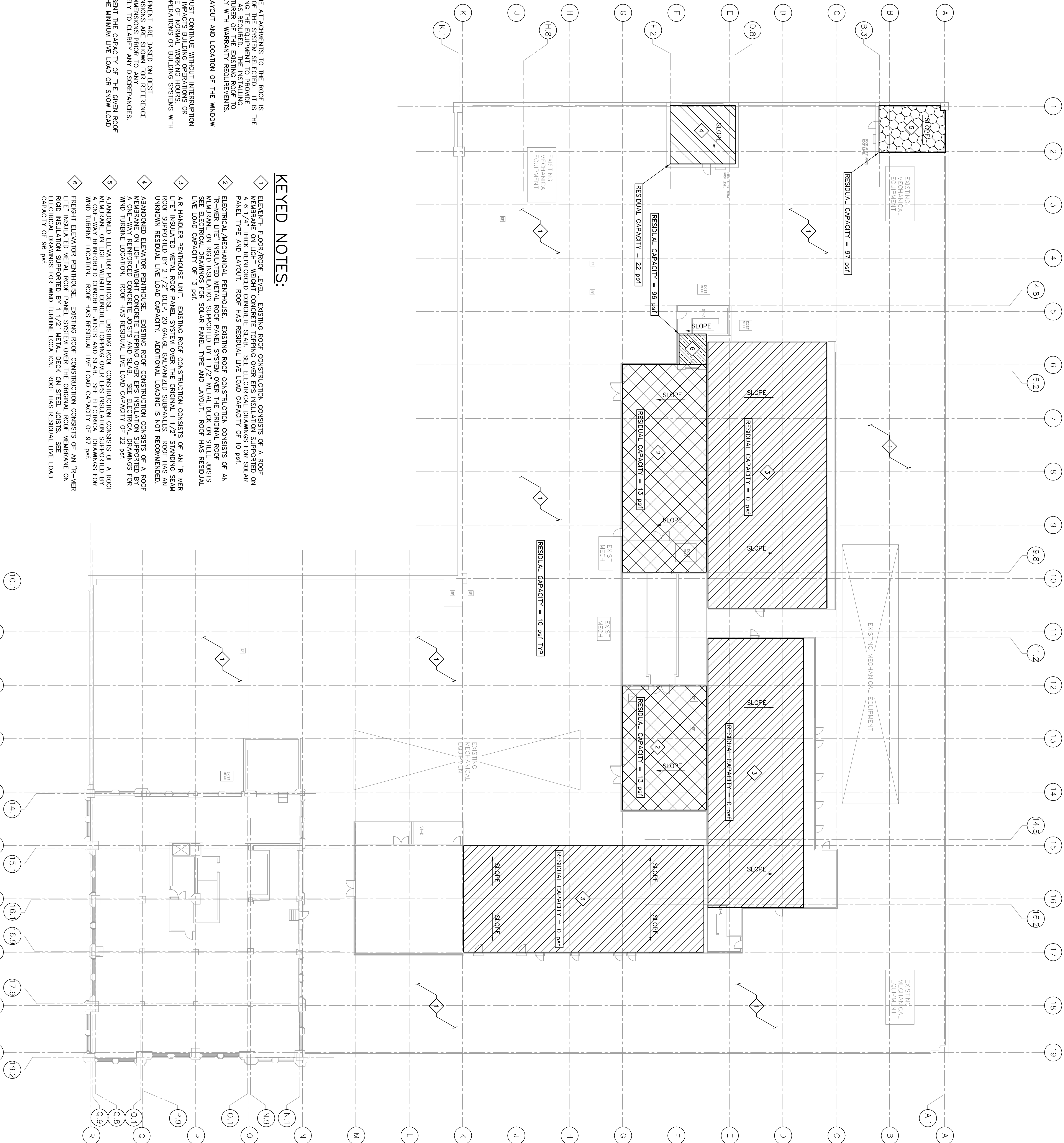
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1 ELEVENTH FLOOR/ROOF AND PENTHOUSE ROOF PLAN

SCALE: 1/16" = 1'-0"

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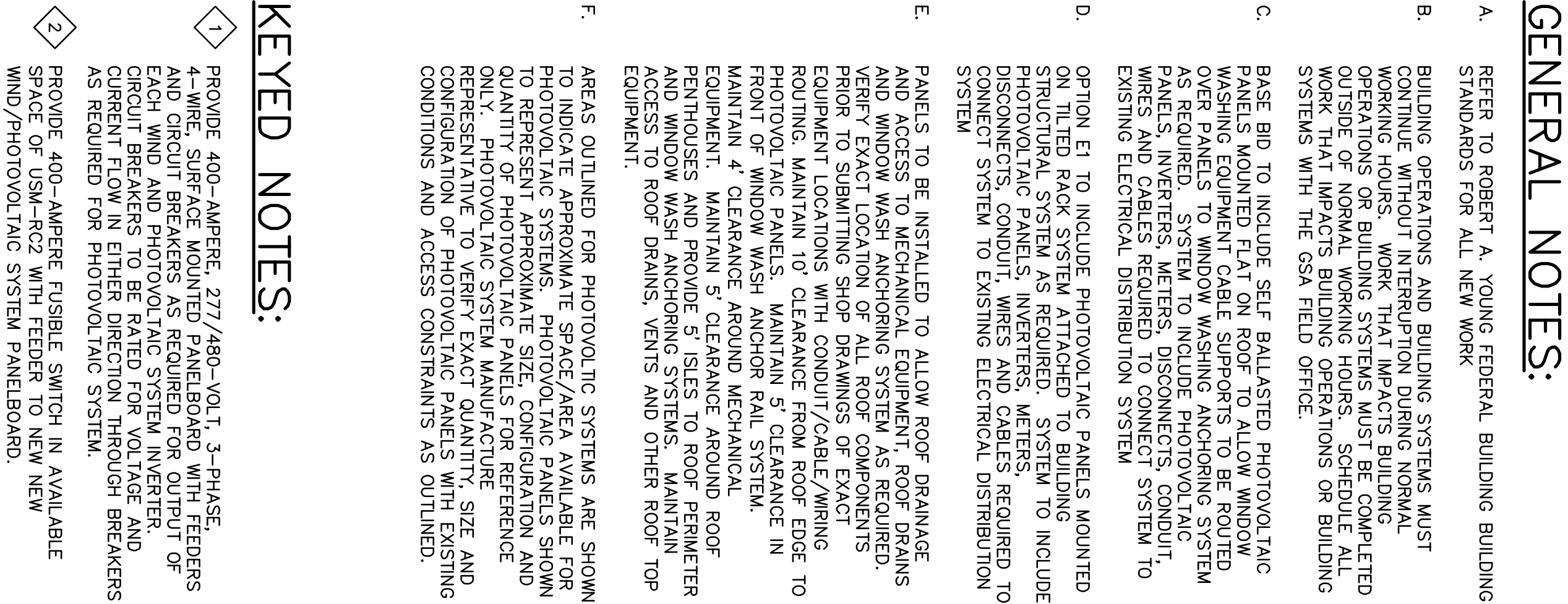


GENERAL NOTES:

1. THE DESIGN OF SOLAR PANEL AND WIND TURNING ATTACHMENTS TO THE ROOF IS DEPENDENT ON THE TYPE AND MANUFACTURER OF THE SYSTEM SELECTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL THE NECESSARY DETAILS AND DETAILS FOR ATTACHMENTS TO THE STRUCTURE AS REQUIRED. THE INSTALLING CONTRACTOR MUST COORDINATE WITH MANUFACTURER OF THE EXISTING ROOF TO ENSURE THAT METHODS OF ATTACHMENT COMPLY WITH WARRANTY REQUIREMENTS.
2. SEE ELECTRICAL PERMITS FOR APPROXIMATE LAYOUT AND LOCATION OF THE WINDOW WASHING SYSTEM.
3. BUILDING OPERATIONS AND BUILDING SYSTEMS MUST CONTINUE WITHOUT INTERRUPTION DURING NORMAL WORKING HOURS. WORK THAT IMPACTS BUILDING OPERATIONS OR BUILDING SYSTEMS MUST BE COMPLETED OUTSIDE OF NORMAL WORKING HOURS.
4. ALL WORK THAT IMPACTS BUILDING OPERATIONS OR BUILDING SYSTEMS WITHIN THE OPEN FIELD OF VIEW.
5. DIMENSIONS OF EXISTING STRUCTURES AND EQUIPMENT ARE BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO ANY REFERENCE TO ANY CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO ANY REFERENCE TO ANY CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY TO CLARIFY ANY DISCREPANCIES.
6. RESIDUAL LIVE LOAD CAPACITIES SHOWN REPRESENT THE CAPACITY OF THE GIVEN ROOF AREA TO SUPPORT LOADS SUPERIMPOSED ON THE MINIMUM LIVE LOAD OR SNOW LOAD REQUIRED BY THE BUILDING CODE.

KEYED NOTES:

- 1 ELEVATED FLOOR ROOF LEVEL. EXISTING ROOF CONSTRUCTION CONSISTS OF A ROOF MEMBRANE ON LIGHT-WEIGHT CONCRETE TOPPING OVER EPS INSULATION SUPPORTED ON 6" x 12" WOOD MEMBERED CONCRETE SLABS. SEE ELECTRICAL DRAMINGS FOR SOLAR PANEL TYPE AND LAYOUT. ROOF HAS RESIDUAL LIVE LOAD CAPACITY OF 10 psf.
- 2 INSULATED METAL ROOF PANEL SYSTEM OVER THE ORIGINAL ROOF JOISTS. SEE ELECTRICAL/MECHANICAL DRAWINGS FOR SOLAR PANEL TYPE AND LAYOUT. ROOF HAS RESIDUAL LIVE LOAD CAPACITY OF 13 psf.
- 3 AIR HANDLER PENHOUSE UNIT. EXISTING ROOF CONSTRUCTION CONSISTS OF AN "B-W" MEMBRANE INSULATED METAL PANEL SYSTEM OVER THE ORIGINAL 1 1/2" STANDING SEAM ROOF SUPPORTED BY 2 1/2" DEEP, 20 GAUGE GALVANIZED SHAPES. ROOF HAS AN UNKNOWN RESIDUAL LIVE LOAD CAPACITY. ADDITIONAL LOADINGS IS NOT RECOMMENDED.
- 4 ABANDONED ELEVATOR PENHOUSE. EXISTING ROOF CONSTRUCTION CONSISTS OF A ROOF MEMBRANE ON LIGHT-WEIGHT CONCRETE TOPPING OVER EPS INSULATION SUPPORTED BY A ONE-WAY REINFORCED CONCRETE JOISTS AND SLAB. SEE ELECTRICAL DRAWINGS FOR WIND TURBINE LOCATION. ROOF HAS RESIDUAL LIVE LOAD CAPACITY OF 22 psf.
- 5 ABANDONED ELEVATOR PENHOUSE. EXISTING ROOF CONSTRUCTION CONSISTS OF A ROOF MEMBRANE ON LIGHT-WEIGHT CONCRETE TOPPING OVER EPS INSULATION SUPPORTED BY A ONE-WAY REINFORCED CONCRETE JOISTS AND SLAB. SEE ELECTRICAL DRAWINGS FOR WIND TURBINE LOCATION. ROOF HAS RESIDUAL LIVE LOAD CAPACITY OF 97 psf.
- 6 FREIGHT ELEVATOR PENHOUSE. EXISTING ROOF CONSTRUCTION CONSISTS OF AN "B-W" MEMBRANE INSULATED METAL PANEL SYSTEM OVER THE ORIGINAL ROOF MEMBRANE ON ELECTRICAL DRAWINGS FOR WIND TURBINE LOCATION. ROOF HAS RESIDUAL LIVE LOAD CAPACITY OF 96 psf.



KEYED NOTES:

1. PROVIDE 400-AMPERE, 277/480-VOLT, 3-PHASE, 4-WIRE, SURFACE MOUNTED PANELBOARD WITH FEEDERS AND CIRCUIT BREAKERS AS REQUIRED FOR OUTLET OF EACH WIND AND PHOTOVOLTAIC SYSTEM INVERTER. PROVIDE CIRCUIT BREAKERS TO BE RATED FOR VOLTAGE AND CURRENT FLOW IN EITHER DIRECTION THROUGH BREAKERS AS REQUIRED FOR PHOTOVOLTAIC SYSTEM.
2. PROVIDE 400-AMPERE FUSIBLE SWITCH IN AVAILABLE SPACE OF URM-R2 WITH FEEDER TO NEW NEW WIND/PHOTOVOLTAIC SYSTEM PANELBOARD.

1 ELEVENTH FLOOR AND ROOF PLAN

[illegible]



1 WIND TURBINES TO BE ATTACHED TO PENTHOUSE STRUCTURE AS REQUIRED BY WIND TURBINE MANUFACTURE. VERIFY STRUCTURAL ATTACHMENT DETAILS WITH STRUCTURAL ENGINEER.

[illegible][illegible]



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1 PROVIDE 400-AMPERE FUSED SWITCH WITH 400-AMPERE FUSES AVAILABLE SPACE ON EXISTING UNIT SUBSTATION FOR CONNECTION OF NEW WIND AND PV SYSTEM OUTPUT.

A. REFER TO ROBERT A. YOUNG FEDERAL BUILDING STANDARDS FOR ALL NEW WORK.

B. BASE BID TO INCLUDE SELF BALLASTED PHOTOVOLTAIC PANELS (RATED OUTPUT APPROXIMATELY 100W) MOUNTED FLAT ON ROOF TO ALLOW WINDWASHING EQUIPMENT CABLE SUPPORTS TO BE ROUTED OVER PANELS TO WINDOW WASHING EQUIPMENT. INCLUDE PHOTOVOLTAIC PANELS, INVERTERS, METERS, DISCONNECTS, CONDUIT, WIRES AND CABLES REQUIRED TO CONNECT SYSTEM TO EXISTING ELECTRICAL DISTRIBUTION SYSTEM.

C. OPTION BID E1 TO INCLUDE PHOTOVOLTAIC PANELS (RATED OUTPUT APPROXIMATELY 70W) MOUNTED ON TILTED RACK SYSTEM ATTACHED TO BUILDING STRUCTURAL SYSTEM AS REQUIRED. SYSTEM TO INCLUDE PHOTOVOLTAIC PANELS, INVERTERS, METERS, DISCONNECTS, CONDUIT, WIRES AND CABLES REQUIRED TO CONNECT SYSTEM TO EXISTING ELECTRICAL DISTRIBUTION SYSTEM.

D. OPTION BID E2 TO INCLUDE PHOTOVOLTAIC PANELS (RATED OUTPUT APPROXIMATELY 15W) MOUNTED ON SUPPORT SYSTEM ATTACHED TO BUILDING STRUCTURAL SYSTEM AS REQUIRED. SYSTEM TO INCLUDE PHOTOVOLTAIC PANELS, INVERTERS, METERS, DISCONNECTS, CONDUIT, WIRES AND CABLES REQUIRED TO CONNECT SYSTEM TO EXISTING ELECTRICAL DISTRIBUTION SYSTEM.

E. OPTION BID E3 TO INCLUDE VERTICAL ACCESS WIND TURBINES (RATED OUTPUT APPROXIMATELY 8W) WITH STRUCTURAL SUPPORT CAGES INSTALLED ON EXISTING METERS, DISCONNECTS, CONDUIT, WIRES AND CABLES REQUIRED TO CONNECT SYSTEM TO EXISTING ELECTRICAL DISTRIBUTION SYSTEM.

F. EXACT QUANTITY OF PHOTOVOLTAIC TILES, PANELS, AND INVERTERS TO BE DETERMINED BY MANUFACTURER BASED ON AVAILABLE ROOF SPACE AS SHOWN ON ROOF PLANS.

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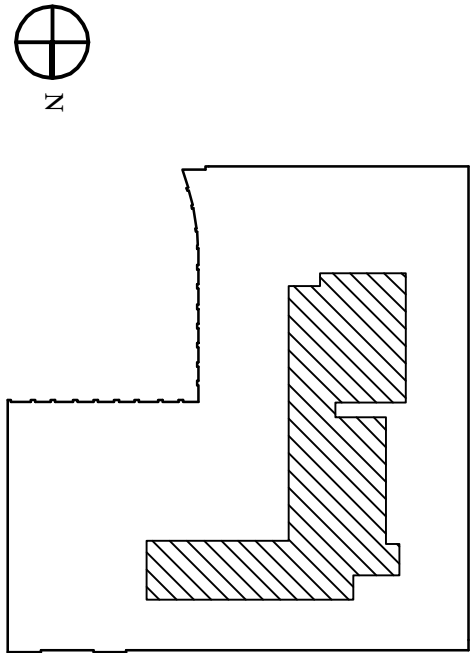
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CERTIFICATIONS

KEY PLAN



MARK	DATE	DESCRIPTION
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[illegible]

REVISION NOTES

GRAPHIC SCALE	

GRAPHIC SCALE

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TITLE	RAY ARRA MECHANICAL
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DESCRIPTION	WIND / PV PACKAGE
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PROJECT NO.	11M000020
GSA PM	DENISE RYERKIEK

SUBMISSION	FINAL SUBMITTAL 100%
SUB. DATE	7/01/2010

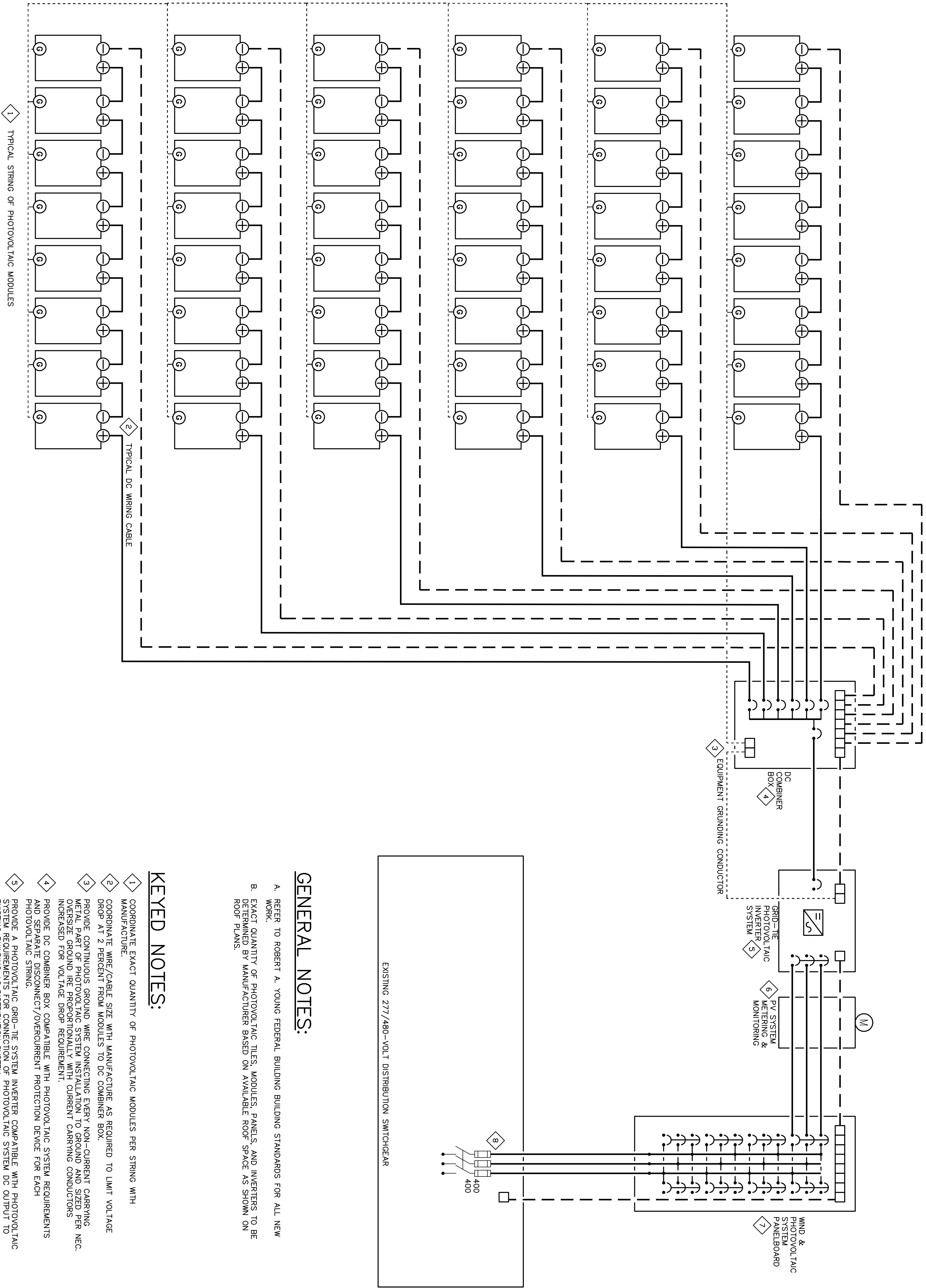
DRAWING TITLE	ELECTRICAL ONE-LINE
FILE NAME	EP-602-IM000090

DRAWN BY	ABH	DATE DRAWN:	6/7/2011
FLOOR NO.	NA		

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DRAWING NO. **EP 0**

SHEET 6 OF



GENERAL NOTES:

- A. REFER TO ROBERT A. YOUNG FEDERAL BUILDING STANDARDS FOR ALL NEW WORK.
- B. EXACT QUANTITY OF PHOTOVOLTAIC TILES, MODULES, PANELS, AND INVERTERS TO BE DETERMINED BY MANUFACTURER BASED ON AVAILABLE ROOF SPACE AS SHOWN ON ROOF PLANS.

KEYED NOTES:

1. COORDINATE EXACT QUANTITY OF PHOTOVOLTATIC MODULES PER STRING WITH MANUFACTURER.
2. COORDINATE WIRE/CABLE SIZE WITH MANUFACTURER AS REQUIRED TO LIMIT VOLTAGE DROP AT 1% PERCENT FROM MODULES TO DC COMBINER BOX.
3. PROVIDE CONTINUOUS GROUND WHEN CONNECTING EVERY NON-CURRENT CARRYING OVERSIZE GROUND RIE PROPORTIONALLY WITH CURRENT CARRYING CONDUCTORS INCREASED FOR VOLTAGE DROP REQUIREMENT.
4. PROVIDE DC COMBINER BOX COMPATIBLE WITH PHOTOVOLTATIC SYSTEM REQUIREMENTS AND SEPARATE DISCONNECT/OVERTCURRENT PROTECTION DEVICE FOR EACH PHOTOVOLTATIC STRING.
5. PROVIDE A SINGLE SPD-TYPE SYSTEM INVERTER COMPATIBLE WITH PHOTOVOLTATIC SYSTEM REQUIREMENTS FOR CONNECTION OF PHOTOVOLTATIC SYSTEM DC OUTPUT TO EXISTING BUILDING AC DISTRIBUTION SYSTEM.
6. PROVIDE WIND AND PHOTOVOLTATIC SYSTEM METERING EQUIPMENT WITH MMS SERVER AND CONNECTION TO GSA LAN IN ACCORDANCE WITH GSA IT POLICIES TO MONITOR THE OUTPUT OF EACH WIND OR PHOTOVOLTATIC SYSTEM.
7. PROVIDE 270/480-VOLT, 3-PHASE, 4-WIRE, SINGLE-PHASE MOUNTED, 400-AMPERE PHOTOVOLTATIC SYSTEM INVERTER OUTPUT TO PHOTOVOLTAIC BUS, PROVIDE PROPERLY SIZED BREAKERS AND WIRES IN CONDUIT AS REQUIRED FOR FULL RATED OUTPUT OF EACH INVERTER.
8. PROVIDE 400-AMPERE USED SWITCH IN EXISTING SWITCHGEAR WITH TWO SETS OF (4/3/0, 0), 1/2-IN. CONDUITS TO NEW P/V/WIND PHOTOVOLTAIC BUS.

1 TYPICAL PHOTOVOLTAIC SYSTEM WIRING DIAGRAM